FIG. 1

DECIMAL	BINARY
0	000000
1	000001
2	000010
4	000100
5	000101
8	001000
9	001001
10	001010
16	010000
17	010001
18	010010
20	010100
21	010101
32	100000
33	100001
34	100010
36	100100
37	100101
40	101000
41	101001
42	101010

FIG. 2

ID NUMBER	0			1			2			3		
D(k)		C(k)	S(k+1)		C(k)	S(k+1)		C(k)	S(k+1)		C(k)	S(k+1)
0	1	000001	0	9	001001	0	33	100001	0	41	101001	0
1	1	000001	1	9	001001	1	33	100001	1	41	101001	1
2	17	010001	0	5	000101	0	17	010001	0	37	100101	0
3	17	010001	1	5	000101	1	17	010001	1	37	100101	1
4	18	010010	1	2	000010	1	18	010010	1	34	100010	1
5	18	010010	2	2	000010	2	18	010010	2	34	100010	2
6	18	010010	3	2	000010	3	18	010010	3	34	100010	3
7	21	010101	0	4	000100	1	36	100100	1	21	010101	0
8	21	010101	1	4	000100	2	36	100100	2	21	010101	1
9	20	010100	1	4	000100	3	36	100100	3	20	010100	1
10	20	010100	2	10	001010	1	42	101010	1	20	010100	2
11	20	010100	3	10	001010	2	42	101010	3	20	010100	3
12	0	000000	2	10	001010	3	42	101010	2	32	100000	2
13	0	000000	3	8	001000	1	40	101000	1	32	100000	3
14	16	010000	2	8	001000	2	40	101000	2	16	010000	2
15	16	010000	3	8	001000	3	40	101000	3	16	010000	3

FIG. 3

ID	0			1			2			3		
D(k)		C(k)	S(k+1)		C(k)	S(k+1)		C(k)	S(k+1)		C(k)	S(k+1)
0	1	000001	0	9	001001	0	33	100001	0	41	101001	0
1	17	010001	1	5	000101	1	17	010001	1	37	100101	1
2	18	010010	2	2	000010	2	18	010010	2	34	100010	2
3	17	010001	0	5	000101	0	17	010001	0	37	100101	0
4	18	010010	1	2	000010	1	18	010010	1	34	100010	1
5	1	000001	1	9	001001	1	33	100001	1	41	101001	1
6	18	010010	3	2	000010	3	18	010010	3	34	100010	3
7	20	010100	1	4	000100	1	36	100100	1	20	010100	1
8	21	010101	0	4	000100	2	36	100100	2	21	010101	0
9	20	010100	2	4	000100	3	36	100100	3	20	010100	2
10	21	010101	1	10	001010	1	42	101010	1	21	010101	1
11	20	010100	3	8	001000	1	40	101000	1	20	010100	3
12	16	010000	2	8	001000	2	40	101000	2	16	010000	2
13	0	000000	3	10	001010	3	42	101010	3	32	100000	3
14	16	010000	3	8	001000	3	40	101000	3	16	010000	3
15	0	000000	2	10	001010	2	42	101010	2	32	100000	2

FIG. 4

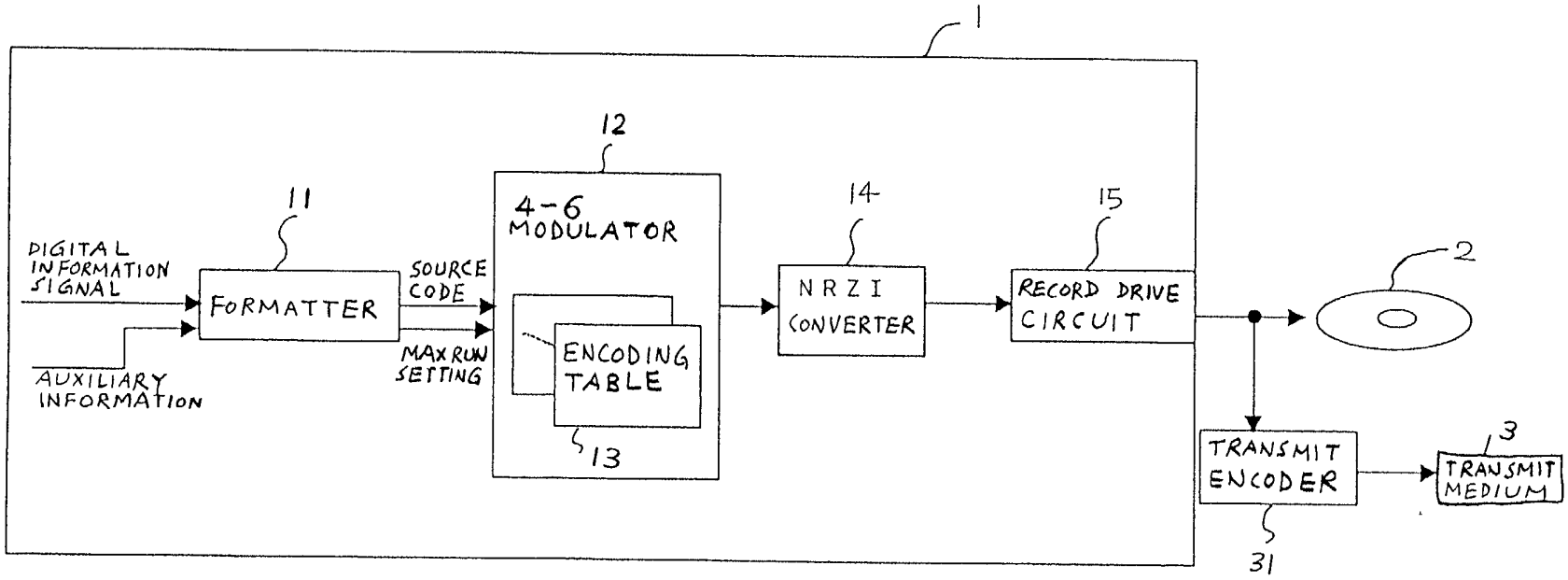

1
12
11
4-6
MODULATOR
14
15
2
DIGITAL
INFORMATION
SIGNAL
FORMATTER
SOURCE
CODE
MAX RUN
SETTING
ENCODING
TABLE
13
N R Z I
CONVERTER
RECORD DRIVE
CIRCUIT
AUXILIARY
INFORMATION
TRANSMIT
ENCODER
31
3
TRANSMIT
MEDIUM

FIG. 5

RECORDING SECTOR	0	1	2	3	4	.....
MAX RUN SETTING SIGNAL	1	0	0	1	1	.....
Tmax	9	8	8	9	9	

FIG. 6

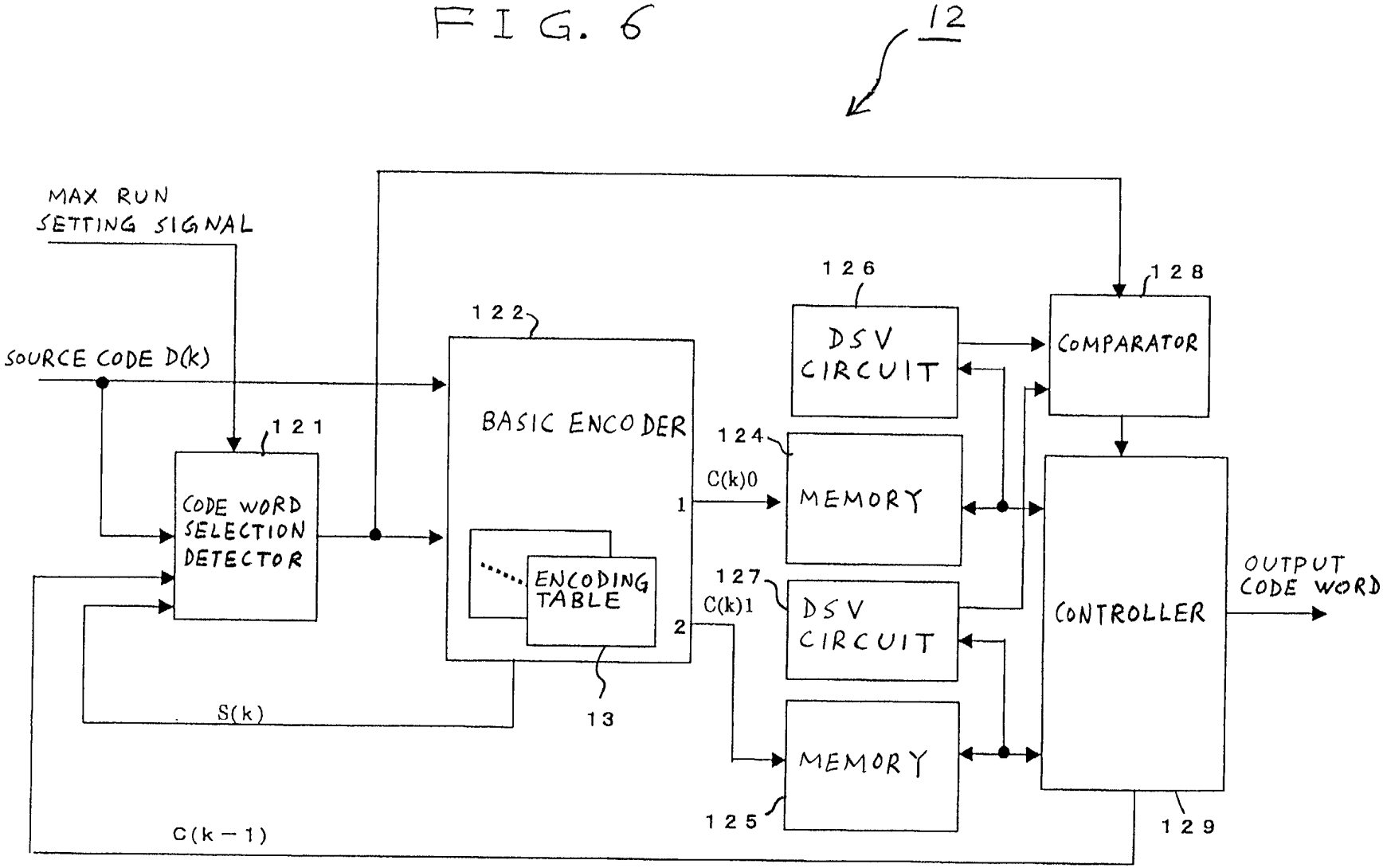

12
MAX RUN SETTING SIGNAL
SOURCE CODE D(k)
121
CODE WORD SELECTION DETECTOR
122
BASIC ENCODER
ENCODING TABLE
13
S(k)
C(k−1)
126
DSV CIRCUIT
124
MEMORY
C(k)0
1
2
C(k)1
127
DSV CIRCUIT
MEMORY
125
128
COMPARATOR
CONTROLLER
129
OUTPUT CODE WORD

FIG. 7

INPUT CODE WORD D(k)	CURRENT-TABLE SELECTION NUMBER S(k)	OUTPUT CODE WORD C(k)	NEXT-TABLE SELECTION NUMBER S(k+1)
4	0	18	1
5	1	2	2
6	2	18	3
7	3	21	0
8	0	21	1

FIG. 9

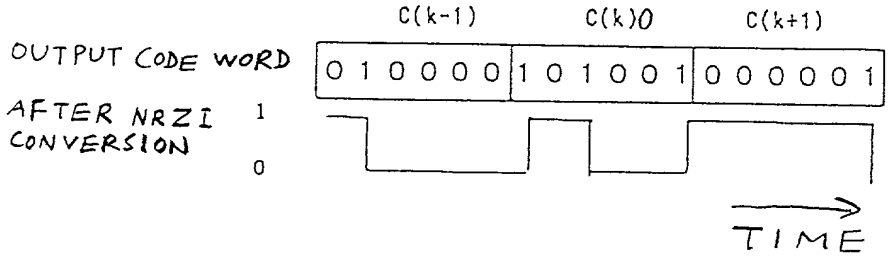


FIG. 10

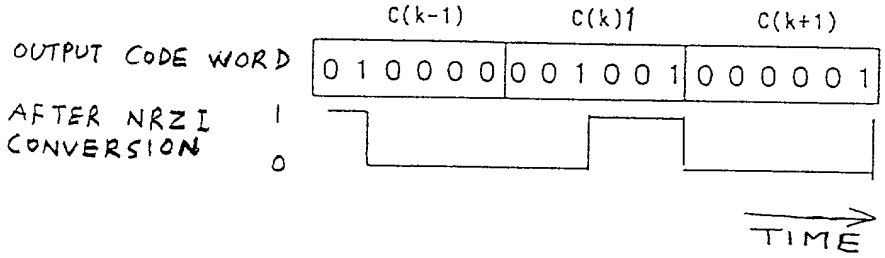


FIG. 8

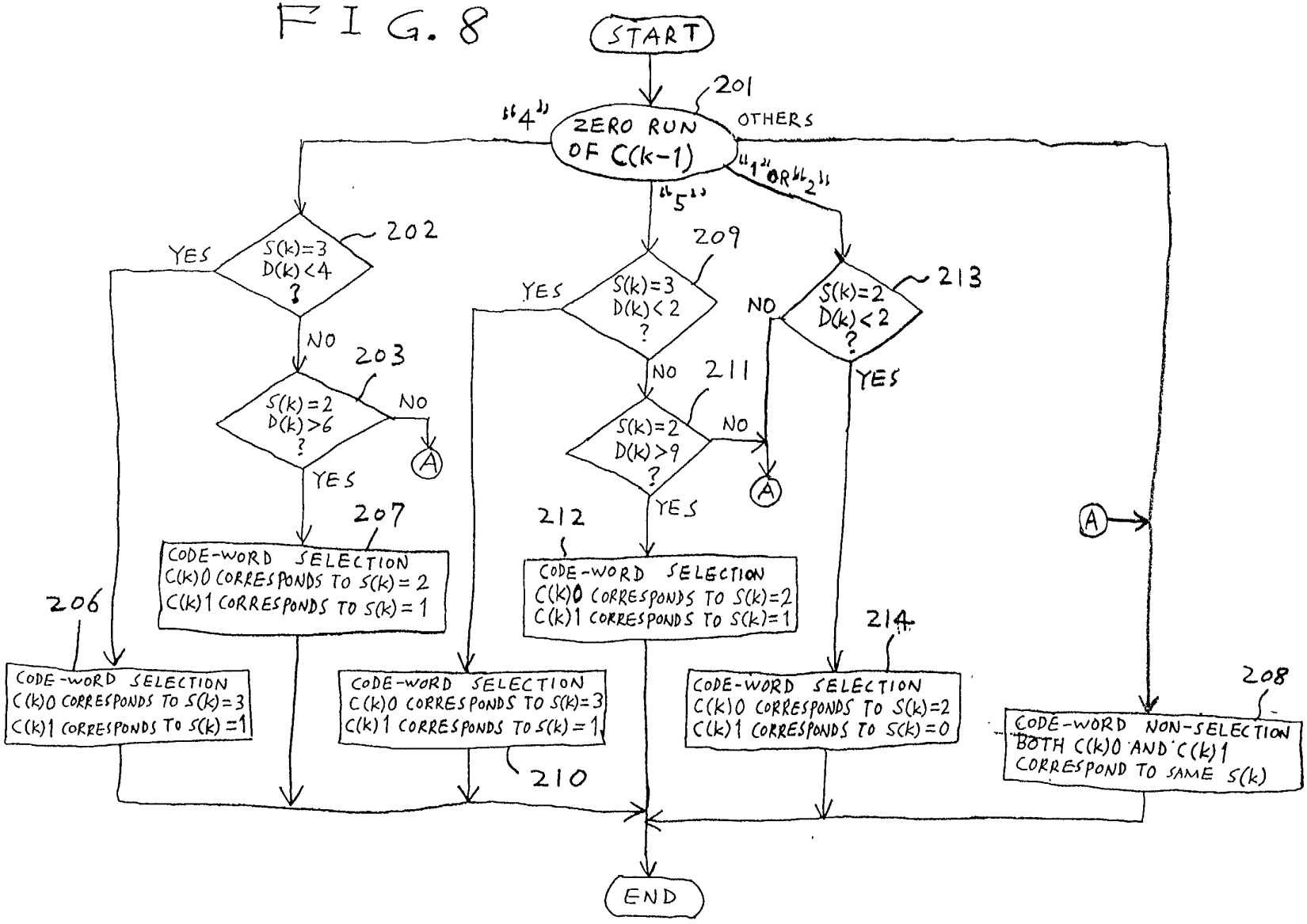

START
201
ZERO RUN OF C(k-1)
"4"
OTHERS
"1" OR "2"
"5"
202
S(k)=3 D(k)<4 ?
YES
NO
203
S(k)=2 D(k)>6 ?
NO
YES
A
207
CODE-WORD SELECTION
C(k)0 CORRESPONDS TO S(k)=2
C(k)1 CORRESPONDS TO S(k)=1
206
CODE-WORD SELECTION
C(k)0 CORRESPONDS TO S(k)=3
C(k)1 CORRESPONDS TO S(k)=1
209
S(k)=3 D(k)<2 ?
YES
NO
211
S(k)=2 D(k)>9 ?
NO
YES
A
212
CODE-WORD SELECTION
C(k)0 CORRESPONDS TO S(k)=2
C(k)1 CORRESPONDS TO S(k)=1
CODE-WORD SELECTION
C(k)0 CORRESPONDS TO S(k)=3
C(k)1 CORRESPONDS TO S(k)=1
210
213
S(k)=2 D(k)<2 ?
NO
YES
214
CODE-WORD SELECTION
C(k)0 CORRESPONDS TO S(k)=2
C(k)1 CORRESPONDS TO S(k)=0
A
208
CODE-WORD NON-SELECTION
BOTH C(k)0 AND C(k)1
CORRESPOND TO SAME S(k)
END

FIG. 11

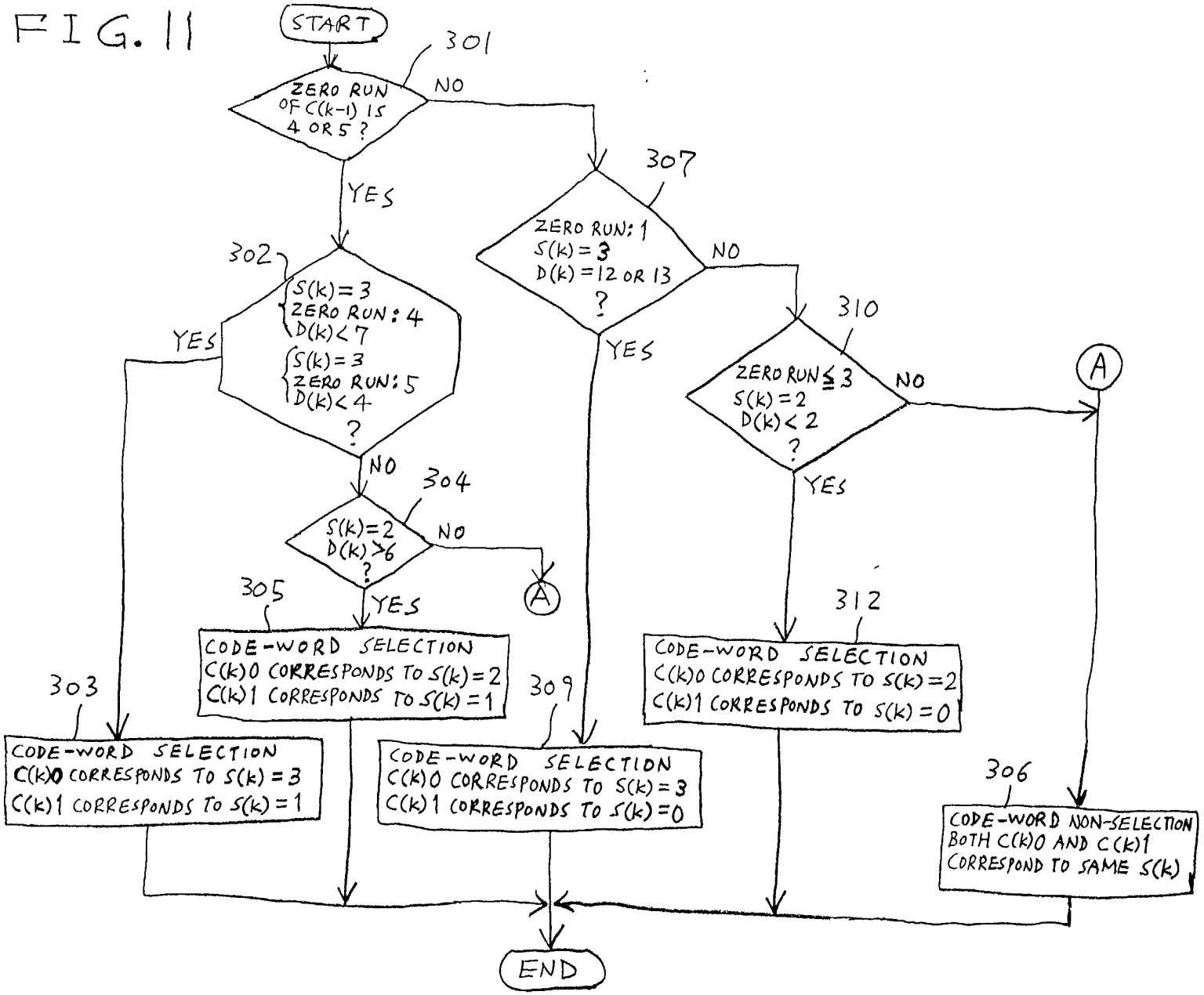

START
301
ZERO RUN OF C(k-1) IS 4 OR 5 ?
NO
YES
307
ZERO RUN: 1
S(k) = 3
D(k) = 12 OR 13
?
NO
YES
310
ZERO RUN ≦ 3
S(k) = 2
D(k) < 2
?
NO
YES
A
302
S(k) = 3
ZERO RUN: 4
D(k) < 7
S(k) = 3
ZERO RUN: 5
D(k) < 4
?
YES
NO
304
S(k) = 2
D(k) > 6
?
NO
YES
A
305
CODE-WORD SELECTION
C(k)0 CORRESPONDS TO S(k) = 2
C(k)1 CORRESPONDS TO S(k) = 1
312
CODE-WORD SELECTION
C(k)0 CORRESPONDS TO S(k) = 2
C(k)1 CORRESPONDS TO S(k) = 0
303
CODE-WORD SELECTION
C(k)0 CORRESPONDS TO S(k) = 3
C(k)1 CORRESPONDS TO S(k) = 1
309
CODE-WORD SELECTION
C(k)0 CORRESPONDS TO S(k) = 3
C(k)1 CORRESPONDS TO S(k) = 0
306
CODE-WORD NON-SELECTION
BOTH C(k)0 AND C(k)1
CORRESPOND TO SAME S(k)
END

FIG. 12

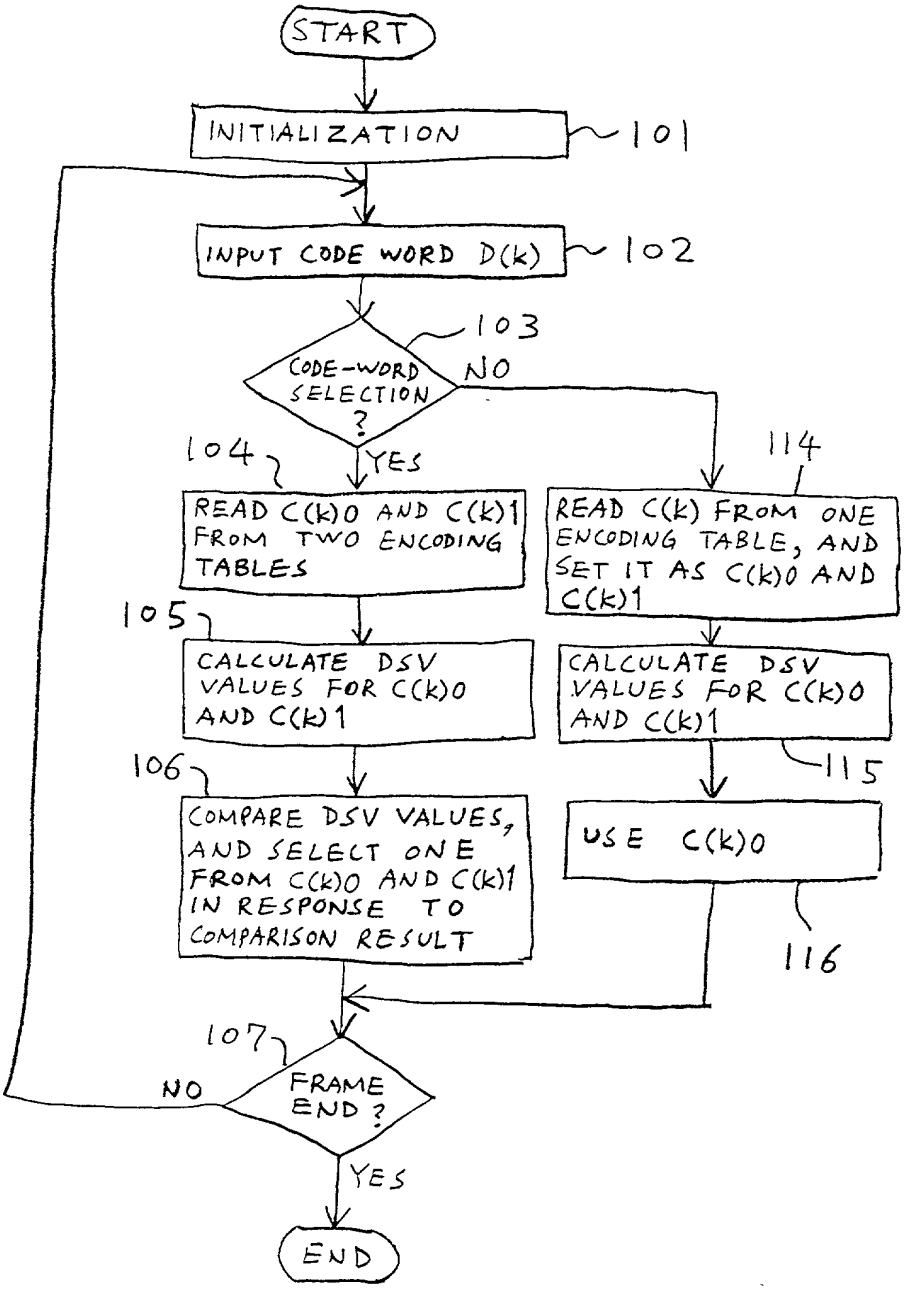

START
INITIALIZATION
101
INPUT CODE WORD D(k)
102
103
CODE-WORD SELECTION ?
NO
YES
104
READ C(k)0 AND C(k)1 FROM TWO ENCODING TABLES
105
CALCULATE DSV VALUES FOR C(k)0 AND C(k)1
106
COMPARE DSV VALUES, AND SELECT ONE FROM C(k)0 AND C(k)1 IN RESPONSE TO COMPARISON RESULT
114
READ C(k) FROM ONE ENCODING TABLE, AND SET IT AS C(k)0 AND C(k)1
CALCULATE DSV VALUES FOR C(k)0 AND C(k)1
115
USE C(k)0
116
107
FRAME END ?
NO
YES
END

FIG. 13

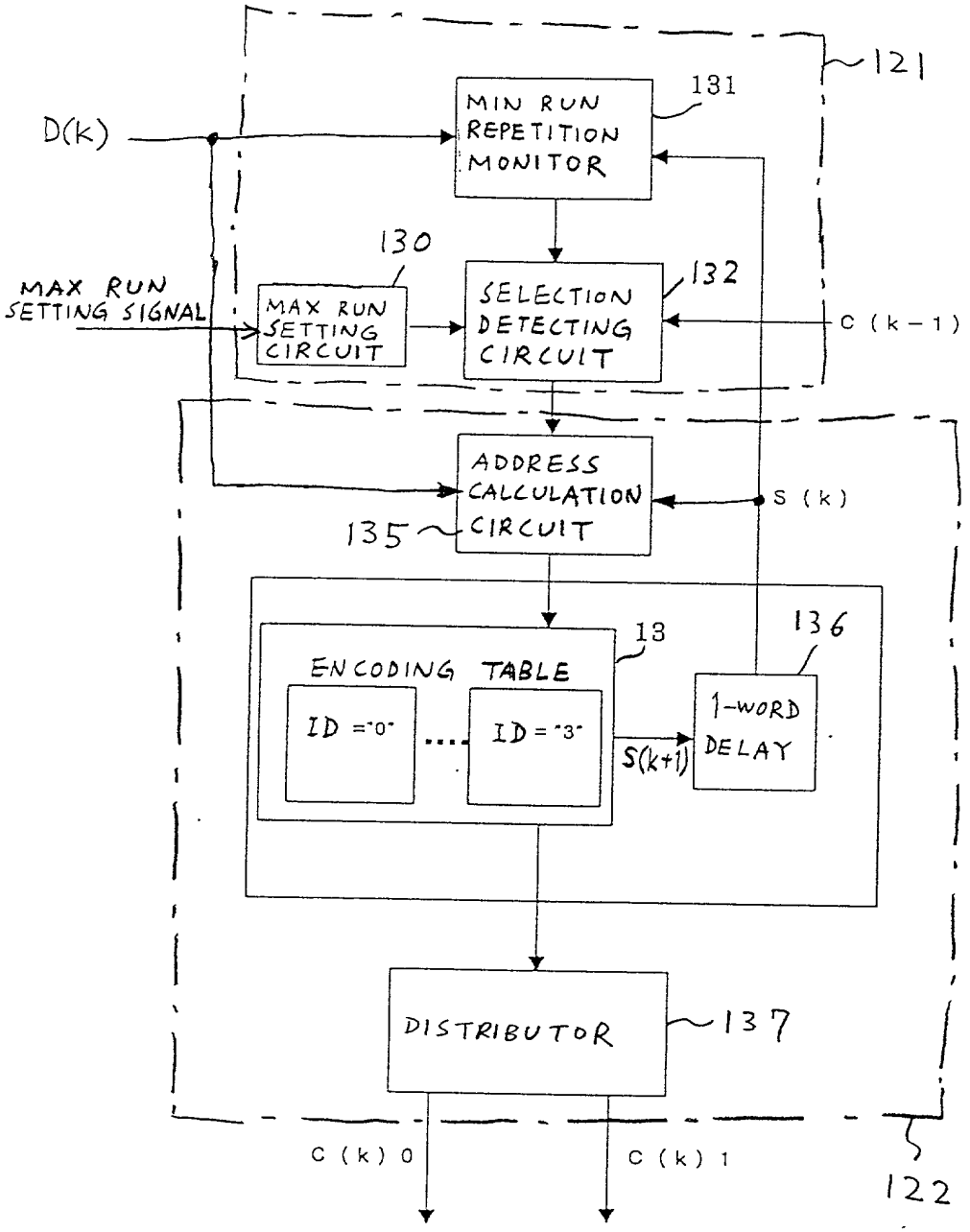

121
131
MIN RUN REPETITION MONITOR
D(k)
130
MAX RUN SETTING SIGNAL
MAX RUN SETTING CIRCUIT
132
SELECTION DETECTING CIRCUIT
C (k − 1)
ADDRESS CALCULATION CIRCUIT
135
S (k)
13
136
ENCODING TABLE
ID ="0"
ID = "3"
S(k+1)
1-WORD DELAY
DISTRIBUTOR
137
C (k) 0
C (k) 1
122

FIG. 14

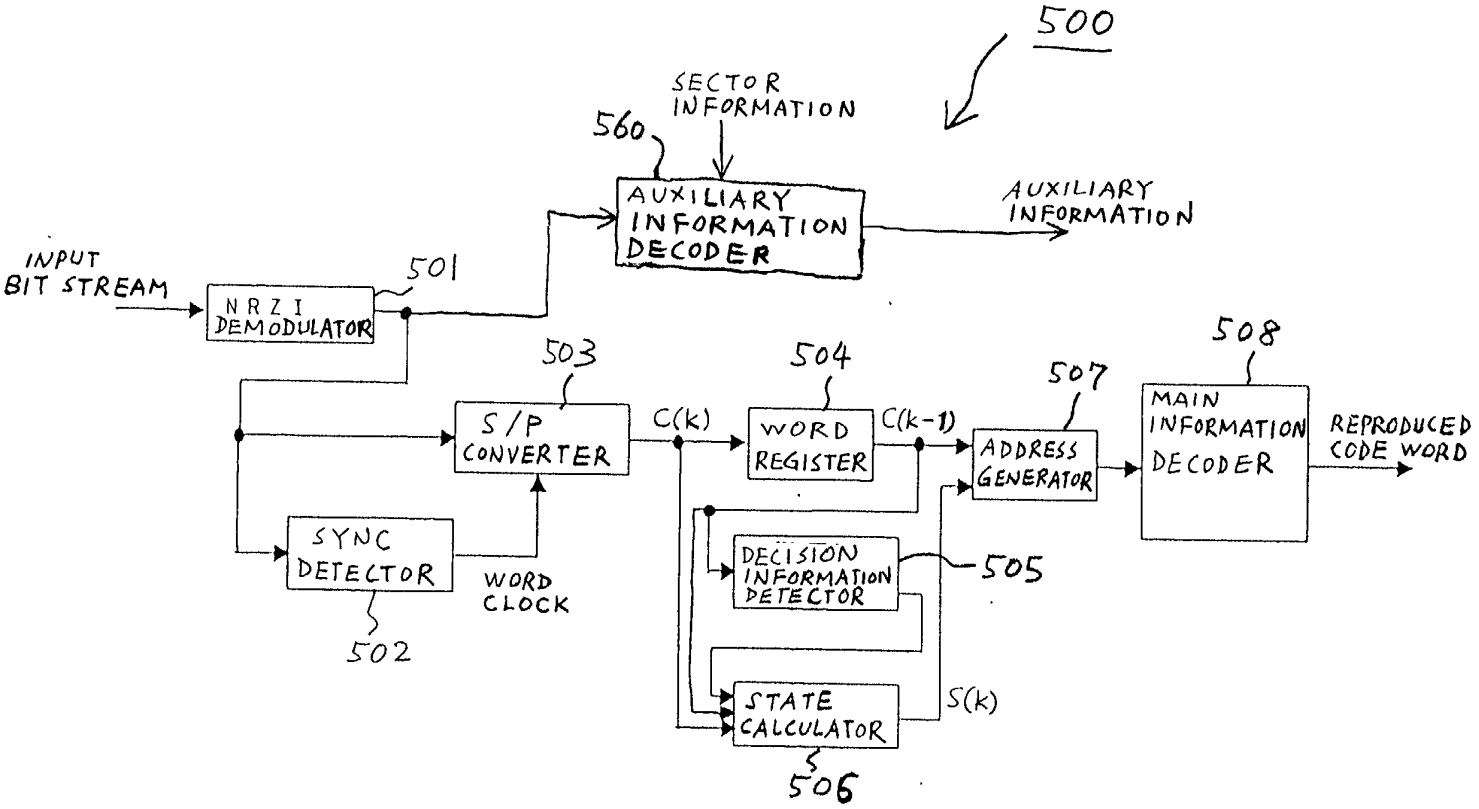


FIG. 15

C(k-1)		DECISION INFORMATION	D(k-1)			
DECIMAL	BINARY		S(k)=0	S(k)=1	S(k)=2	S(k)=3
0	000000	2	7	–	12	13
1	000001	0	0	1	–	–
2	000010	1	–	4	5	6
4	000100	1	–	7	8	9
5	000101	0	2	3	–	–
8	001000	1	–	13	14	15
9	001001	0	0	1	–	–
10	001010	1	–	10	11	12
16	010000	2	–	–	14	15
17	010001	0	2	3	–	–
18	010010	1	–	4	5	6
20	010100	1	–	9	10	11
21	010101	0	7	8	–	–
32	100000	2	–	–	12	13
33	100001	0	0	1	–	–
34	100010	1	–	4	5	6
37	100101	0	2	3	–	–
40	101000	1	–	13	14	15
41	101001	0	7	8	–	–
42	101010	1	–	10	12	11

FIG. 16

D(k)	C(k)	DECISION INFORMATION	S(k)
15	010000	2	3
0	001001	0	0
1	000001	0	1
2	000101	0	0
3	010001	0	—

FIG. 17

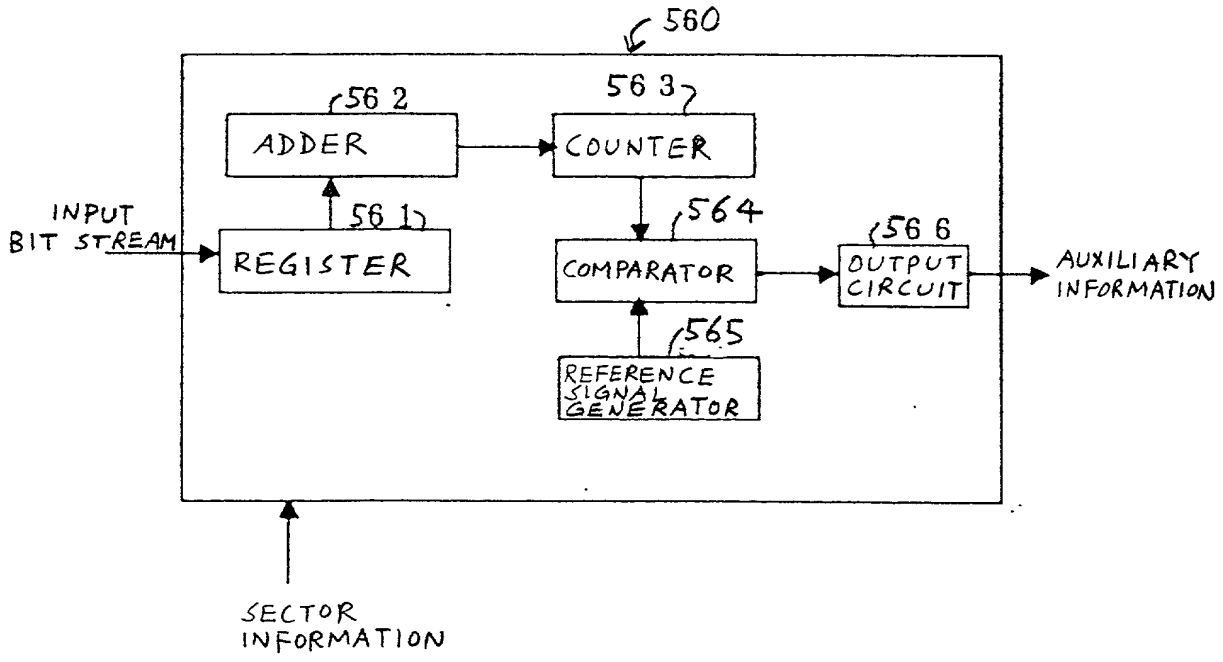


FIG. 18

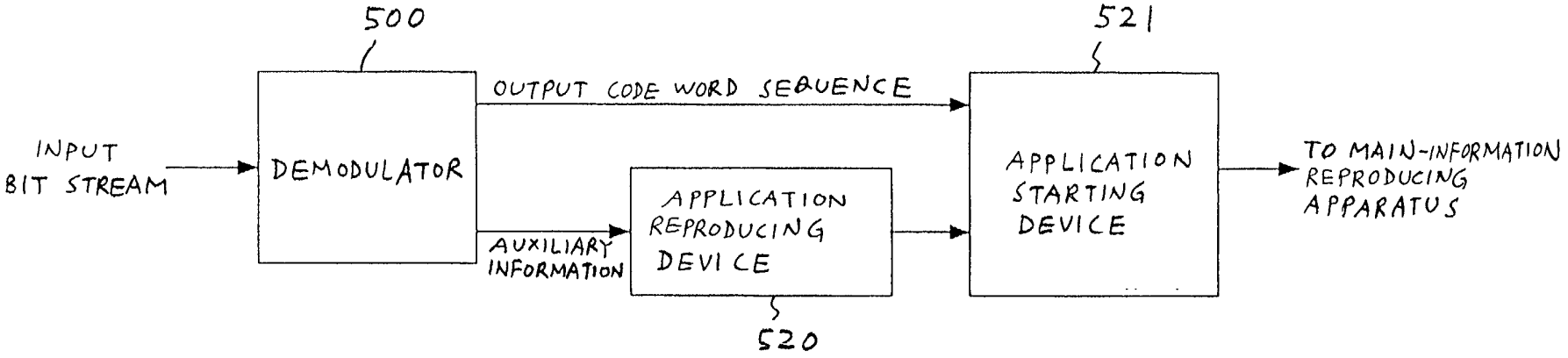

500
521
OUTPUT CODE WORD SEQUENCE
INPUT
BIT STREAM
DEMODULATOR
APPLICATION
REPRODUCING
DEVICE
AUXILIARY
INFORMATION
APPLICATION
STARTING
DEVICE
TO MAIN-INFORMATION
REPRODUCING
APPARATUS
520

FIG. 19

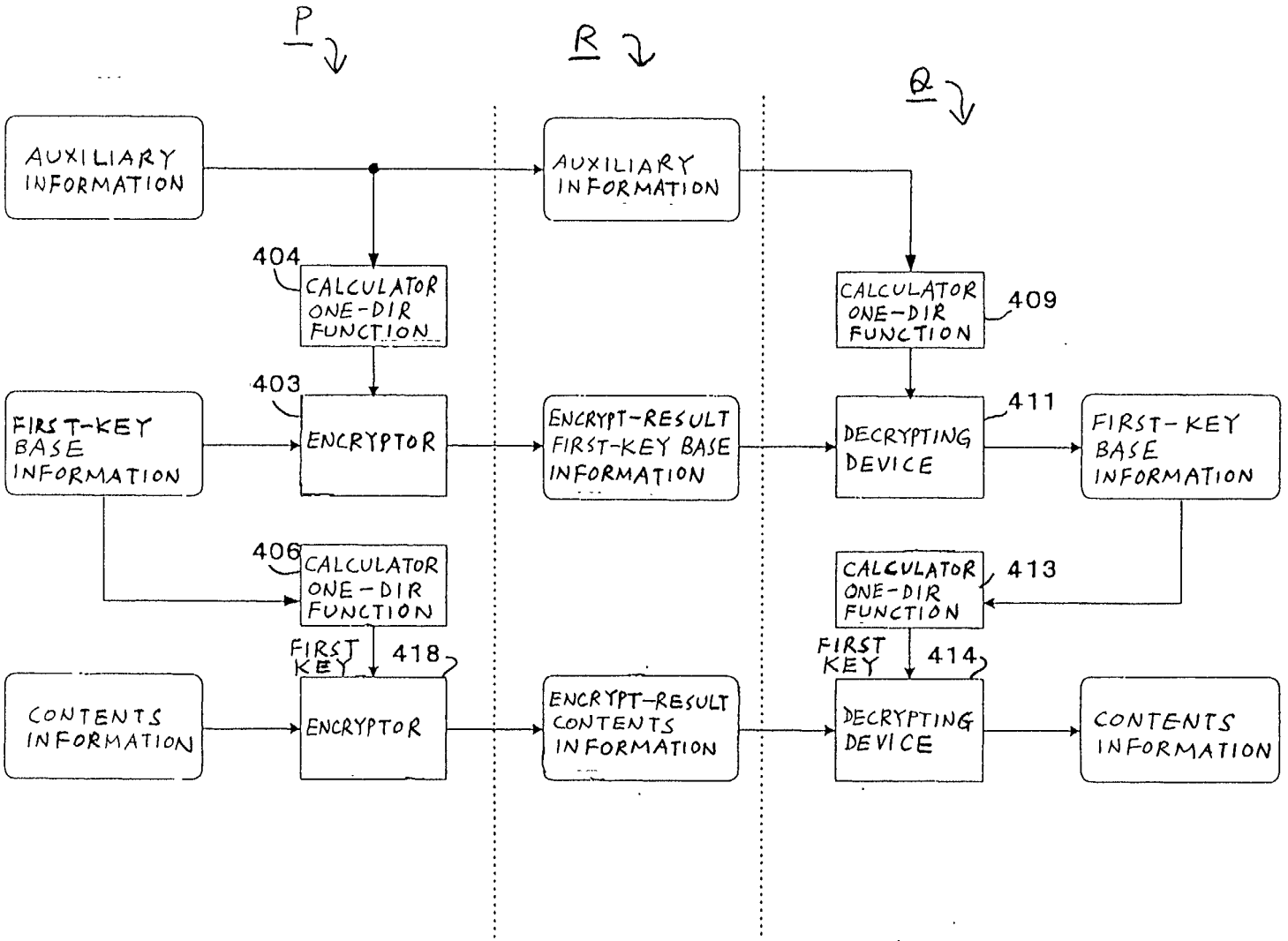

P
R
Q
AUXILIARY INFORMATION
AUXILIARY INFORMATION
404
CALCULATOR ONE-DIR FUNCTION
CALCULATOR ONE-DIR FUNCTION
409
403
FIRST-KEY BASE INFORMATION
ENCRYPTOR
ENCRYPT-RESULT FIRST-KEY BASE INFORMATION
DECRYPTING DEVICE
411
FIRST-KEY BASE INFORMATION
406
CALCULATOR ONE-DIR FUNCTION
CALCULATOR ONE-DIR FUNCTION
413
FIRST KEY
418
FIRST KEY
414
CONTENTS INFORMATION
ENCRYPTOR
ENCRYPT-RESULT CONTENTS INFORMATION
DECRYPTING DEVICE
CONTENTS INFORMATION

FIG. 20

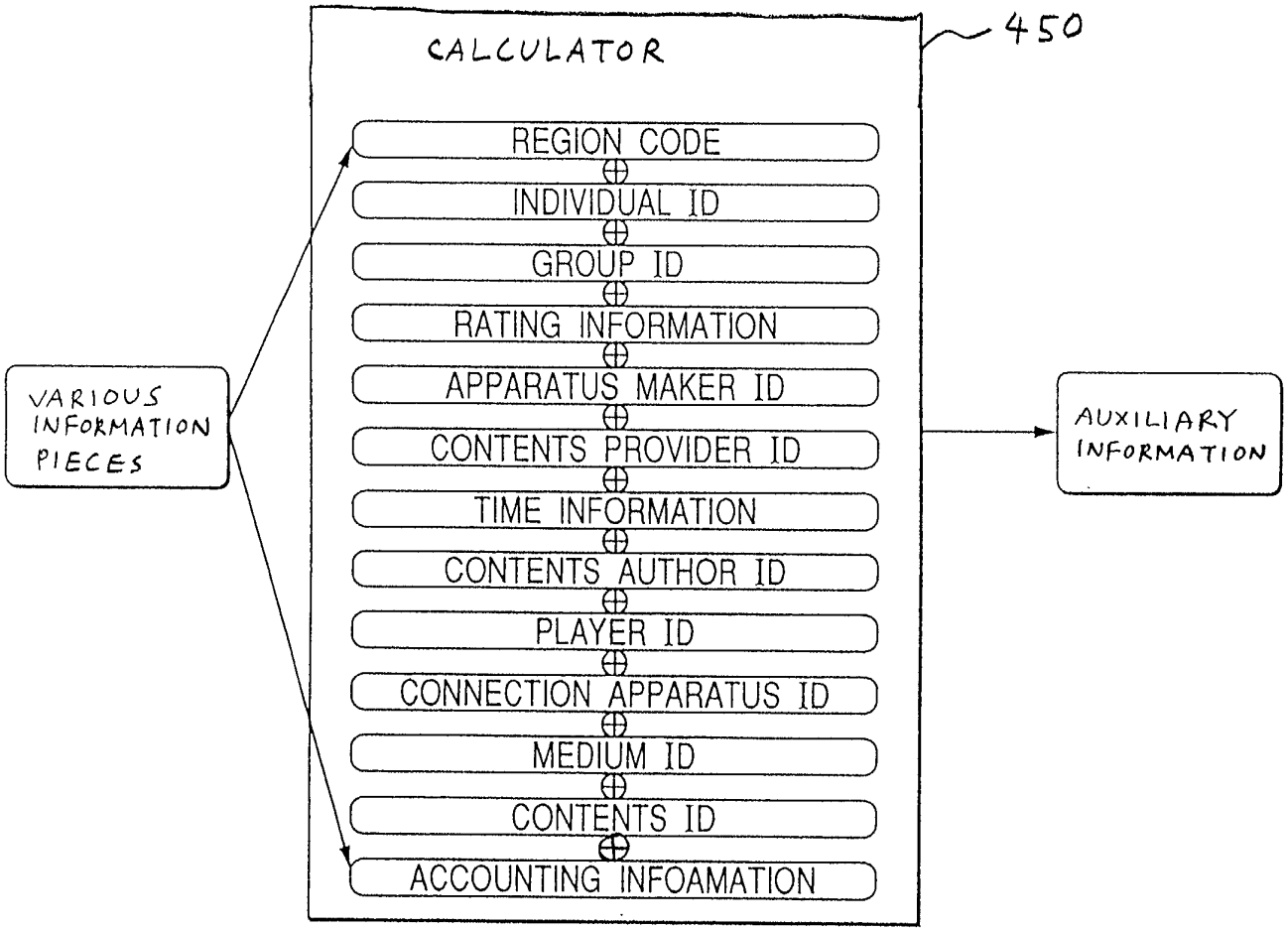

CALCULATOR
450
REGION CODE
INDIVIDUAL ID
GROUP ID
RATING INFORMATION
APPARATUS MAKER ID
CONTENTS PROVIDER ID
TIME INFORMATION
CONTENTS AUTHOR ID
PLAYER ID
CONNECTION APPARATUS ID
MEDIUM ID
CONTENTS ID
ACCOUNTING INFOAMATION
VARIOUS INFORMATION PIECES
AUXILIARY INFORMATION

FIG. 21

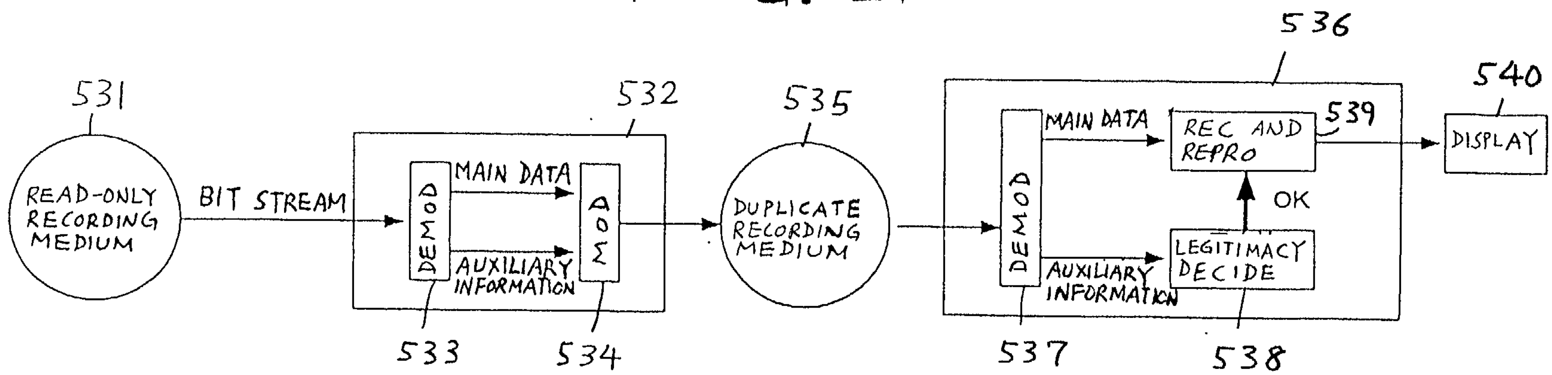
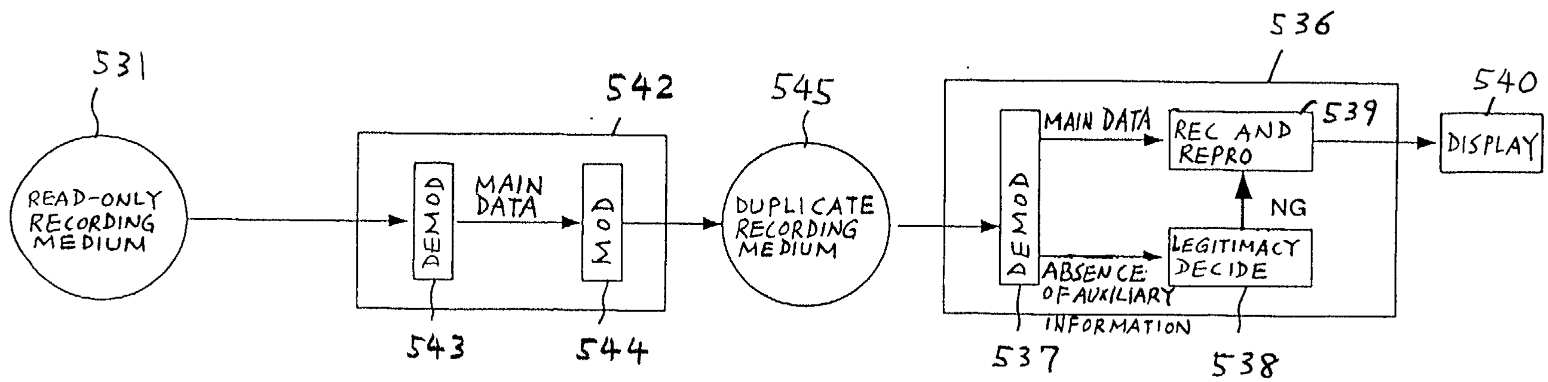

531
READ-ONLY RECORDING MEDIUM
BIT STREAM
532
DEMOD
MAIN DATA
AUXILIARY INFORMATION
MOD
533
534
535
DUPLICATE RECORDING MEDIUM
536
DEMOD
MAIN DATA
AUXILIARY INFORMATION
REC AND REPRO
539
OK
LEGITIMACY DECIDE
537
538
540
DISPLAY

FIG. 22


531
READ-ONLY RECORDING MEDIUM
542
DEMOD
MAIN DATA
MOD
543
544
545
DUPLICATE RECORDING MEDIUM
536
DEMOD
MAIN DATA
ABSENCE OF AUXILIARY INFORMATION
REC AND REPRO
539
NG
LEGITIMACY DECIDE
537
538
540
DISPLAY

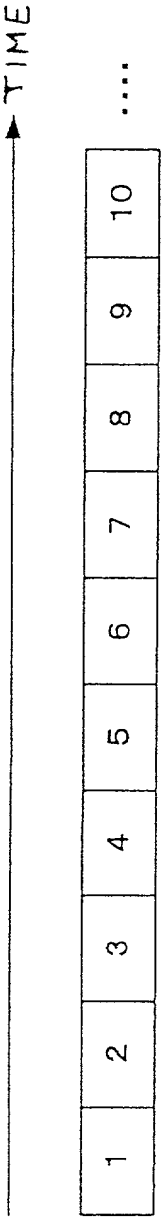


FIG. 23

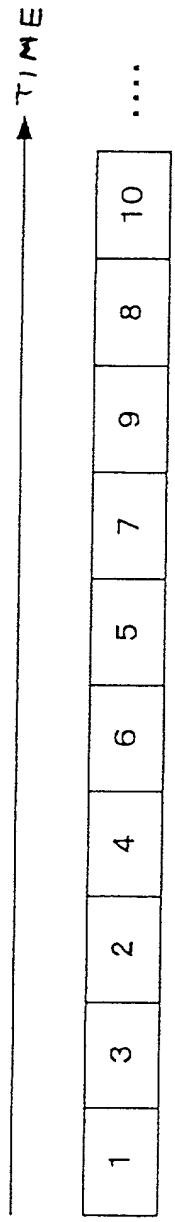


FIG. 24

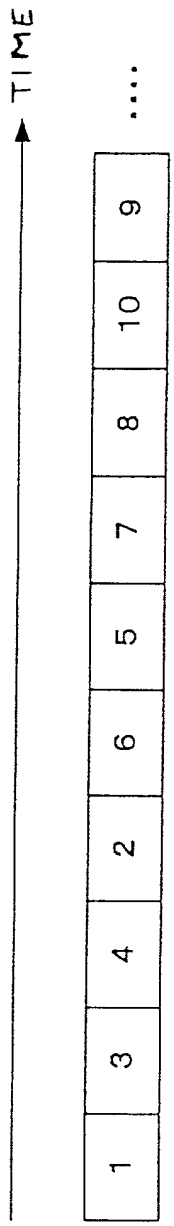


FIG. 25

FIG. 26

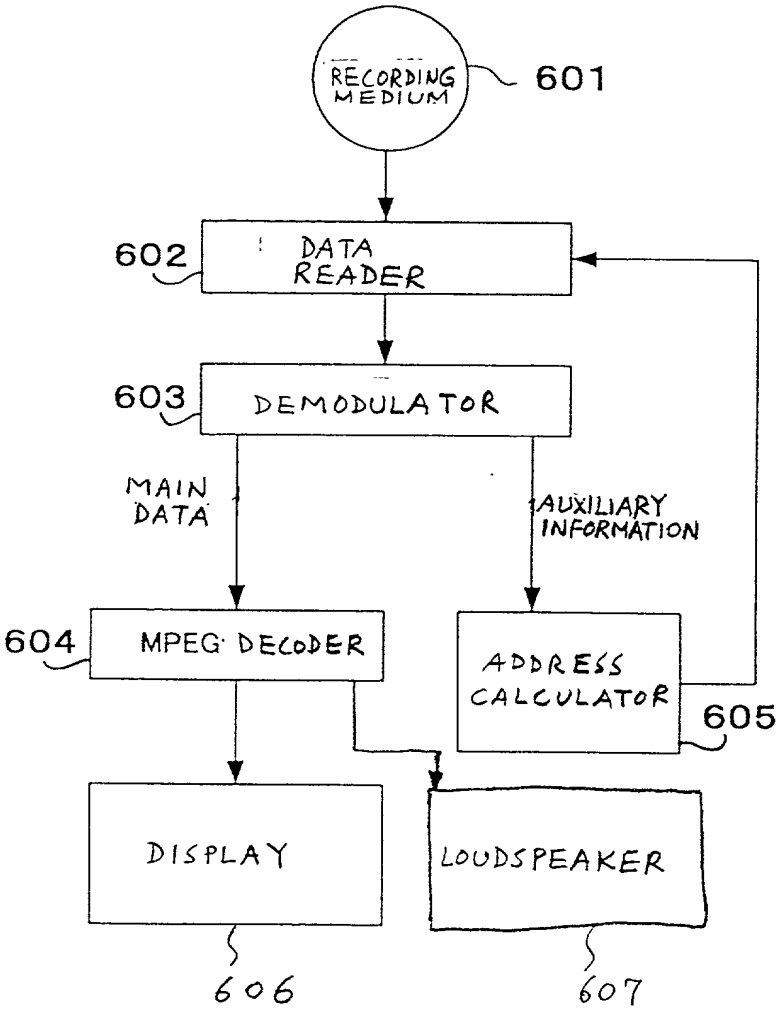
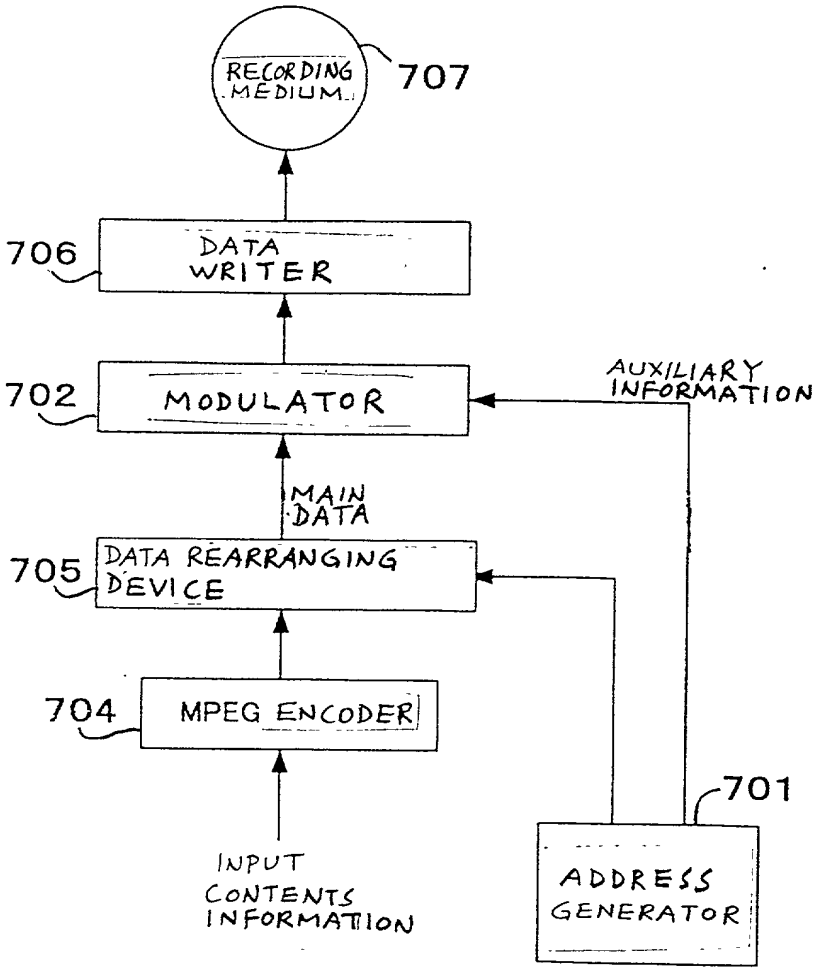

RECORDING MEDIUM
601
602
DATA READER
603
DEMODULATOR
MAIN DATA
AUXILIARY INFORMATION
604
MPEG DECODER
ADDRESS CALCULATOR
605
DISPLAY
LOUDSPEAKER
606
607

FIG. 27


RECORDING MEDIUM
707
706
DATA WRITER
702
MODULATOR
AUXILIARY INFORMATION
MAIN DATA
705
DATA REARRANGING DEVICE
704
MPEG ENCODER
701
INPUT CONTENTS INFORMATION
ADDRESS GENERATOR